

## CLAIMS

1. A method of determining the stability margin, with  
5 respect to a possible self-oscillation, in a radio frequency  
repeater operating with a predetermined delay between an input  
(5) and an output (6) and having a feedback path between said  
output and said input, comprising the steps of

- establishing the amplification of the repeater as a function  
10 of the frequency in a frequency band, and
- observing the magnitude (MA) of wave-like variations in said  
amplification as a function of the frequency, said magnitude  
constituting a measure of the stability margin such that an  
increasing magnitude corresponds to a decreasing stability  
15 margin.

2. The method defined in claim 1, wherein the spectral  
properties of an input signal are known and wherein:

- the step of establishing the amplification as a function of  
20 the frequency is carried out by measuring an output signal  
(P) as a function of the frequency (f) in said frequency  
band, and
- said magnitude (MA) of said wave-like variations and said  
stability margin (SM) are calculated on the basis of the  
25 result of the first step.

3. A method of controlling a radio frequency repeater,  
operating with a predetermined delay between an input and an  
output and having a feedback path between said output and said  
30 input, including the steps of:

- determining the stability margin in the repeater in  
accordance with claim 1 or 2, and
- controlling the gain of the repeater in response to the  
determined stability margin.

4. An apparatus for determining the stability margin,  
with respect to a possible self-oscillation, in a radio

frequency repeater operating with a predetermined delay between an input (5) and an output (6) and having a feedback path between said output and said input, comprising

- at least one sensing element (30, 40) connected to at least one of said input and said output of the repeater , and
- at least one measurement receiver (60) connected to said at least one sensing element for measuring at least an output signal from said repeater, on the basis of which the stability margin (SM) is calculated.

5. The apparatus as defined in claim 4, wherein said at least one sensing element comprises at least one directional coupler.

6. The apparatus as defined in claim 5, wherein two directional couplers are connected to a single measurement receiver via a switch (50) for alternating measurement of the signals at the output and the input, respectively.

7. The apparatus as defined in claim 4, wherein: said measurement receiver (60) is connected to a control unit (70) for controlling the gain of said repeater.

8. The apparatus as defined in claim 4, wherein: said measurement receiver is connectable, via a modem (80), to a central operational monitoring unit, whereby the measurements and calculations for determining said stability margin can be made by remote control.

9. The apparatus as defined in claim 4, wherein: a band pass filter (32, 42) is inserted between said sensing element and said measurement receiver.

10. A repeater system, including a radio frequency  
repeater of the kind having two antennas (1,2) and two links  
therebetween, said two links comprising an uplink (10) for  
5 amplifying signals from a mobile telephone to a base station  
and a downlink (20) for amplifying signals from said base  
station to said mobile telephone, said repeater system being  
provided with an apparatus as defined in any one of the claims  
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